

1. A case or shell for electronic devices, comprising:

a bottom element, a sidewall element, and a top element, wherein part or all of said bottom, part or all of said sidewall element, and part or all of said top are formed of a conductive loaded resin-based material, and wherein said conductive loaded resin-based material comprises conductor fibers, conductor powders, or a combination of said conductor fibers and said conductor powders in a base resin host and the ratio of the weight of said conductor fibers, said conductive powders, or said combination of conductive fibers and conductive powders to the weight of said base resin host is between about 0.20 and 0.40;

an antenna element formed in said sidewall element wherein said antenna element is formed of said conductive loaded resin-based material;

a system having interconnected electronic devices placed within said top element, said sidewall element, and said bottom element; and

electrical connections from said antenna element to said system having interconnected electronic devices.

2. The case or shell of claim 1 wherein said conductor fibers have a cylindrical shape

3. The case or shell of claim 1 wherein the diameter of said conductor fibers are between about 3 and 12 microns.

4. The case or shell of claim 1 wherein the length of said conductor fibers are between about 2 and 14 millimeters.

5. The case or shell of claim 1 wherein said conductor powders comprise conductor
5 particles having a spherical shape.

6. The case or shell of claim 1 wherein said conductor powders comprise conductor particles having a diameter of between about 3 and 12 microns.

10 7. The case or shell of claim 1 wherein said system having interconnected electronic devices is a wireless telephone.

8. The case or shell of claim 1 wherein those parts of said bottom element, said sidewall element, and said top which are formed of said conductive loaded resin based material
15 and which are not part of said antenna element provide electromagnetic absorption.

9. The case or shell of claim 1 wherein said conductor fibers are stainless steel, nickel, copper, silver, carbon, graphite, or plated fibers.

20 10. The case or shell of claim 1 wherein said conductor powders comprise particles of stainless steel, nickel, copper, silver, carbon, graphite, or plated particles.

11. The case or shell of claim 1 wherein said antenna can be designed to operate effectively at frequencies between about 2 Kiloherzt and 300 Gigahertz or any usable radio frequency.

5 12. An electronic circuit package, comprising:

a first package element formed of a conductive loaded resin-based material wherein said conductive loaded resin-based material comprises conductor fibers, conductor powders, or a combination of said conductor fibers and said conductor powders in a base resin host and the ratio of the weight of said conductor fibers, said
10 conductive powders, or said combination of conductive fibers and conductive powders to the weight of said base resin host is between about 0.20 and 0.40;

a substrate formed in said first package element wherein said substrate is an insulator;

integrated circuit elements attached to said substrate;

15 a second package element formed of said conductive loaded resin-based material, wherein said second package element is attached to said first package element covering said substrate and said integrated circuit elements so that said first package element and said second package element form a protective shell and an electromagnetic absorber around said substrate and said integrated circuit elements;

20 conducting electrodes between said substrate and the exterior of said protective shell;

insulation between said conducting electrodes and said first package element; and

insulation between said conducting electrodes and said second package element.

13. The electronic circuit package of claim 12 wherein said conductor fibers have a cylindrical shape

5

14. The electronic circuit package of claim 12 wherein the diameter of said conductor fibers is between about 3 and 12 microns.

15. The electronic circuit package of claim 12 wherein the length of said conductor fibers is between about 2 and 14 millimeters.

10

16. The electronic circuit package of claim 12 wherein said conductor powders comprise conductor particles having a spherical shape.

15 17. The electronic circuit package of claim 12 wherein said conductor powders comprise conductor particles having a diameter of between about 3 and 12 microns.

18. The electronic circuit package of claim 12 wherein said conductor fibers are stainless steel, nickel, copper, silver, carbon, graphite, or plated fibers.

19. The electronic circuit package of claim 12 wherein said conductor powders comprise particles of stainless steel, nickel, copper, silver, carbon, graphite, or plated particles.

20. A method of forming a case or shell for electronic devices, comprising:

- 5 forming a bottom element, a sidewall element, and a top element, wherein part or all of said bottom, part or all of said sidewall element, and part or all of said top are formed of a conductive loaded resin-based material, and wherein said conductive loaded resin-based material comprises conductor fibers, conductor powders, or a combination of said conductor fibers and said conductor powders in a base resin host and the ratio of the
- 10 weight of said conductor fibers, said conductive powders, or said combination of conductive fibers and conductive powders to the weight of said base resin host is between about 0.20 and 0.40;
- forming an antenna element in said sidewall element wherein said antenna element is formed of said conductive loaded resin-based material;
- 15 placing a system having interconnected electronic devices within said top element, said sidewall element, and said bottom element; and
- forming electrical connections from said antenna element to said system having interconnected electronic devices.

- 20 21. The method of claim 20 wherein said conductor fibers have a cylindrical shape

22. The method of claim 20 wherein the diameters of said conductor fibers are between about 3 and 12 microns.

23. The method of claim 20 wherein the length of said conductor fibers is between about
5 2 and 14 millimeters.

24. The method of claim 20 wherein said conductor powders comprise conductor particles having a spherical shape.

10 25. The method of claim 20 wherein said conductor powders comprise conductor particles having a diameter of between about 3 and 12 microns.

26. The method of claim 20 wherein said system having interconnected electronic devices is a wireless telephone.

15

27. The method of claim 20 wherein those parts of said bottom element, said sidewall element, and said top which are formed of said conductive loaded resin based material and which are not part of said antenna element provide electromagnetic absorption for said system having electronic devices.

20

28. The method of claim 20 wherein said conductor fibers are stainless steel, nickel, copper, silver, carbon, graphite, or plated fibers.

29. The method of claim 20 wherein said conductor powders comprise particles of stainless steel, nickel, copper, silver, carbon, graphite, or plated particles.

5 30. The method of claim 20 wherein said antenna can be designed to operate effectively at frequencies between about 2 Kiloherzt and 300 Gigahertz or any usable radio frequency.

31. The method of claim 20 wherein said bottom element, said sidewall element, and said
10 top element are formed using molding, overmolding, or extrusion.

32. A method of forming an electronic circuit package, comprising:

forming a first package element of a conductive loaded resin-based material wherein said conductive loaded resin-based material comprises conductor fibers,
15 conductor powders, or a combination of said conductor fibers and said conductor powders in a base resin host and the ratio of the weight of said conductor fibers, said conductive powders, or said combination of conductive fibers and conductive powders to the weight of said base resin host is between about 0.20 and 0.40;

placing a substrate in said first package element wherein said substrate is an
20 insulator;

attaching integrated circuit elements to said substrate;

forming a second package element of said conductive loaded resin-based material,
wherein said second package element is attached to said first package element covering
said substrate and said integrated circuit elements so that said first package element and
said second package element form a protective shell and an electromagnetic shield around
5 said substrate and said integrated circuit elements;

attaching conducting electrodes between said substrate and the exterior of said
protective shell;

placing insulation between said conducting electrodes and said first package
element; and

10 placing insulation between said conducting electrodes and said second package
element.

33. The method of claim 32 wherein said conductor fibers have a cylindrical shape

15 34. The method of claim 32 wherein the diameters of said conductor fibers are between
about 3 and 12 microns.

35. The method of claim 32 wherein the lengths of said conductor fibers are between
about 2 and 14 millimeters.

20

36. The method of claim 32 wherein said conductor powders comprise conductor
particles having a spherical shape.

37. The method of claim 32 wherein said conductor powders comprise conductor particles having a diameter of between about 3 and 12 microns.

5 38. The method of claim 32 wherein said conductor fibers are stainless steel, nickel, copper, silver, carbon, graphite, or plated fibers.

39. The method of claim 32 wherein said conductor powders comprise particles of stainless steel, nickel, copper, silver, carbon, graphite, or plated particles.

10

40. The method of claim 32 wherein said first package element and said second package element are formed using molding, overmolding, or extrusion.